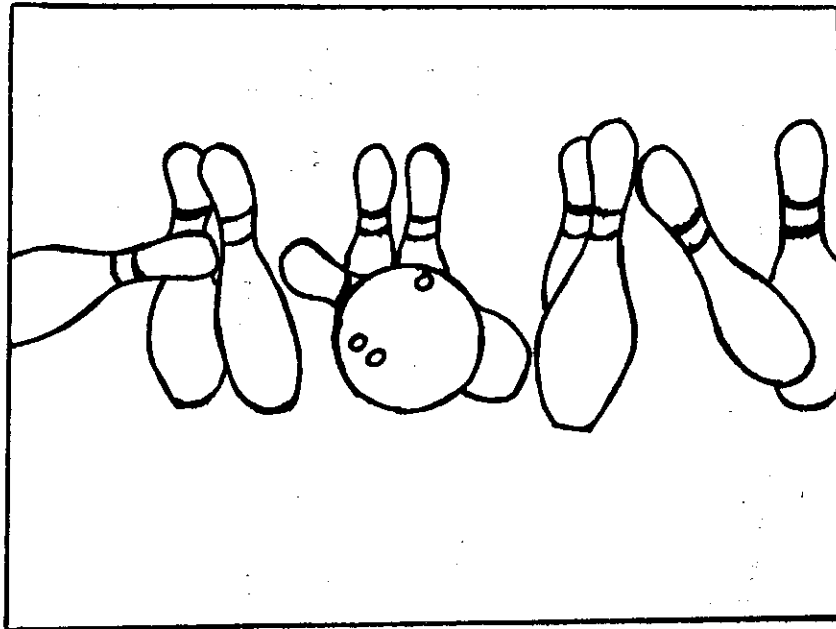FOR TEXAS INSTRUMENTS 99/4 HOME COMPUTER

NATURAL SOFTWARE PRESENTS

3 D   B O W L I N G
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written by TIM FLANAGAN

3 D B O W L I N G I N S T R U C T I O N S

Table of Contents

3D BOWLING--QUICK REFERENCE

Player Names--Abbreviated nickname or initials.

Ball Hardness--0 to 9.   0=HARD=DELAYED,CONSISTENT HOOK. 9=SOFT=EARLY HOOK.

Oil --0 to 9.   0=DRY LANES   9=WET,SLIPPERY LANE.

Oil Evaporation--0 to 9. 0=OIL DOESNT'T CHANGE. 9=RAPID EVAPORATION.
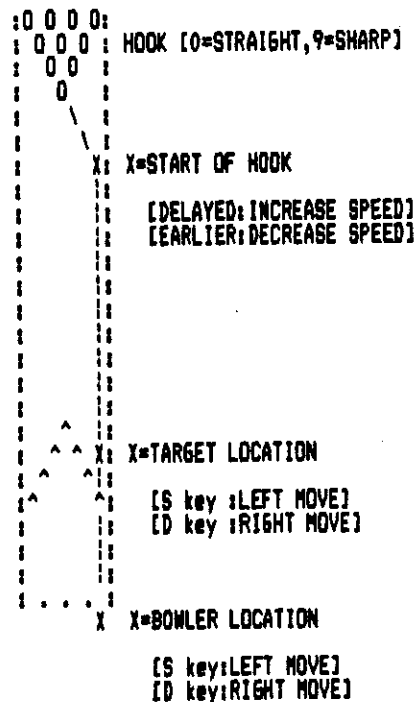
Move Target Marker---S(left) & D(right) keys.

Move Bowler----------S(left) & D(right) keys.

Spin---0=NO SPIN=STRAIGHT BALL. 9=MAXIMUM SPIN=SHARP HOOK.

Speed--0=SLOWEST SPEED=EARLIEST HOOK. 9=MAXIMUM SPEED =MAX. DELAY OF HOOK.
Roll Ball – Press Enter – Timing Important
Game Restart--------R key to restart whole program after 10th frame.

```
:0 0 0 0:
: 0 0 0 : HOOK [0=STRAIGHT,9=SHARP]
:  0 0  :
:   0   :
:   \   :
:    \  :
:     \ :
:      X: X=START OF HOOK
:      ::
:      :: [DELAYED: INCREASE SPEED]
:      :: [EARLIER: DECREASE SPEED]
:      ::
:      ::
:      ::
:      ::
:      ::
:   ^  ::
: ^ ^ X: X=TARGET LOCATION
:^   ^::
:^    ^: [S key :LEFT MOVE]
:     :: [D key :RIGHT MOVE]
:     ::
: . . :
:    X  X=BOWLER LOCATION

          [S key:LEFT MOVE]
          [D key:RIGHT MOVE]
```

NOTE:THE PROGRAM WILL ALWAYS RESET ALL VALUES AND POSITIONS TO THE VALUES
     USED ON THE PREVIOUS FIRST BALL.

     WHEN CHANGING A VALUE OR POSITION PRESS ENTER TO "LOCK IN" THE
     DESIRED SETTING.

3D BOWLING-LOADING PROGRAM BY DISK
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1) Insert NATURAL SOFTWARE 3D BOWLING diskette into drive #1.

2) Turn on power to disk drive,expansion box and console as appropriate.

3) Select Extended Basic from the title screen menu.

4) Program will automatically load in.

5) When the program responds with the question about number of players
   proceed to the "Playing the Game" section of this manual.

3D BOWLING-LOADING PROGRAM BY CASSETTE
----

1) Insert NATURAL SOFTWARE 3D BOWLING cassette into cassette player #1.

2) Turn on tape player and console power and select Extended Basic.

3) Type on OLD CS1 and follow the computer's directions.

4) When the program is loaded then type RUN.

5) The NATURAL SOFTWARE title screen will appear followed by a statement
   "NOW LOADING DATA".DO NOT REWIND the tape as instructed because
   additional data follows the program on the tape.
6) This additional minute loads in 1200 pin actions .You will then be
   asked a question about the number of players.Proceed to the "Playing
   the Game" section of this manual.

3D BOWLING DEFINITIONS/SPEECH VOCABULARY.

Angle--A combination of bowler positioning and lane TARGET forming a LINE
       or trajectory to the HEAD PIN or POCKET.

Arrow--A black triangular marker on the lane to aid the bowler in aiming
       the ball in the proper direction. Some one "playing the third arrow
       " is aiming at the third arrow from the right gutter or edge of the
       lane.

Ball Hardness--Bowling balls vary in surface hardness with soft balls
       tending to "grab" the lane better and hook earlier or
       sharper.

Hook--A curving action of the ball dependent upon lane conditions,spin,
      speed and ball surface hardness.

Lane--A wooden surface (alley) on which the pins are set and the ball is
      rolled. It is 60 feet to the HEAD PIN and is approximately 40 1"
      boards wide. Our 3D LANE is 40 pixels wide at the the pins for real-
      istic scale results.

Line--The trajectory or ANGLE used to get the ball to the POCKET (HEAD PIN
    1-3 POCKET).

Oil--LANES are coated with an oil or other lubricant to reduce ball/LANE
    friction and improve the life of the LANE. Increasing the oil
    however reduces or delays the HOOKing action of the ball.

Pin #'s--   7 8 9 10
              4 5 6
               2 3
                1

Pocket--The area between the #1 and #3 pins where the potential for a
    strike is the greatest.

Speed--How fast the ball is rolled. Usually a fast ball will HOOK late or
    near the pins.

Target--Something (pin,board, or ARROW) that a bowler is aiming at in
    order to get more consistent and accurate "shots" at the pins.

Turn--SPIN caused by a twisting or turning action of the wrist at the
    release of the ball.

3D BOWLING -- PLAYING THE GAME

PLAYERS:

# of Players--1 or 2 only.

Player Names--Use INITIALS or nicknames such as (ABC,TOM,JOE etc.).

LANE CONDITIONS:

Oil-Ranges from 0 to 9. A 0 means the lanes are extremely dry with no oil.
    A 9 means that the lanes are extremely oily,wet or slippery.

Oil Evaporation--Ranges from 0 to 9. A 0 evaporation rate means that the
    oil conditions will remain constant throughout the game.
    A 9 means an extremely rapid drying out of the lanes.
    This means that the ball will hook increasingly during
    the progress of the game.

LANE TARGET:

Oval Marker--On the lane appears an oval movable object called the TARGET.
    This simulates the board or ARROW that a real bowler would
    look at throughout the delivery with the intent of achieving
    greater consistency and accuracy by only having to "hit" a
    target 15 feet away instead of one 60 feet away. This TARGET
    is moved with the S (left) and D (right) keys as a means of
    fine tuning the LINE to the POCKET.The ball is always aimed
    at that target.The program will always reset to the target
    position used on the previous first ball roll.Press ENTER to
    lock in the marker location.

MOVING THE BOWLER:

    The S(left) & D(right) keys are used to move the bowler
    to the desired location on the approach.Standing on the
    right side of the LANE and aiming at a TARGET also on
    the right is called an outside LINE which usually
    results in larger sharp breaking hooks. However standing
    toward the middle or left side of the LANE tends to
    reduce the hooking action of the ball.The program will
    always reset to the previous first ball location.Press
    ENTER to lock in bowler position.

ADJUSTING SPIN AND SPEED:

Spin--Ranges from 0 to 9. A 0 puts no spin on the ball resulting in a
    straight ball. A 9 puts maximum spin on the ball causing the ball to
    HOOK extremely sharp.The program is designed to simulate real
    bowling by selecting from the list of 1200 pin actions the ones
    that are appropriate for that type of hook. Just as in real bowling
    a straight ball will get strikes and splits of the "weak" ball type.
    However,high spin rolls will result in strikes and splits customary
    to bowlers with extremely powerful hooks.The program will always
    reset spin to the value you used on the previous first ball roll.
    Pressing ENTER locks in the spin value.

Speed--Ranges from 0 to 9. A 0 results in the slowest(not visually per-
    ceived) speed of the ball. This causes the ball to start hooking at
    the earliest possible point for those lane conditions. A 9 for
    speed results in the maximum time delay before the ball will start
    hooking.The program will always reset speed to the value used on
    your previous first ball.Pressing ENTER locks in the speed value.

PIN ACTION:

First Ball: Extreme care has been taken to attain about 98% accuracy
    between 1st ball pin action results in this program to that of
    real bowling. This was based on 20 years of bowling experience.

Second Ball: The design goal of keeping this program under 14k resulted in
    a slight compromise in second ball visual effects. However,
    at least a 90% accuracy rate has been achieved. Only in rare
    instances is it possible to make a spare in an unrealistic
    manner. An example of this is the 4-10 which can be made on
    the right side of the 4 pin. The user,however,can assume that
    the 4 bounced off the wall and rolled over to the 10.

GAME OBJECTIVE:

The goal of the player is the same as in real bowling.It is to identify what type of lane conditions exist and figure out which combination of ball,spin,speed and angle are required in order to find a "groove" into the strike pocket.This should be done as quick-ly as possible in order to maximize scores.

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